

FIGURE 1 - PRIOR
ART PROPANE
RECOVERY

TABLE 1 - STREAM SUMMARY FOR FIGURE 1 PROPANE RECOVERY- PRIOR ART

Stream Number	1	2	3	4	5	6	7	8
Temp., °F	68	67	-22	-22	-22	-100	-101	-100
Pressure, psig	1300	1275	1268	1268	1268	449	447	470
Flow, lbmol/hr	109,805	109,805	109,805	109,805	-	109,805	20,796	20,796
Stream Number	9	10	11	12	13	14	17	18
Temp., °F	-102	57	-25	203	-20	-75	-75	-75
Pressure, psig	445	463	440	453	450	445	470	445
Flow, lbmol/hr	105,703	20,796	105,703	4,100	33,395	33,395	16,700	21,800
Stream Number	19	20	21	22	23			
Temp., °F	-75	24	73	201	110			
Pressure, psig	445	433	600	1315	1300			
Flow, lbmol/hr	11,595	105,703	105,703	105,703	105,703			

Key Stream Component Flow (lbmol/hr)

Stream Number	1	7	9	12	13	16	17	23
CO2	1,647	608	1,647	0	1,446		838	1,647
N2	471	15	471	0	19		3	471
C1	97,044	11,907	97,043	0	19,095		7,188	97,043
C2	6,582	4,217	6,528	54	12,831		8,667	6,528
C3	2,988	2,976	13	2,975	5		4	13
IC4	327	327	0	327	0		0	0
NC4	488	488	0	488	0		0	0
IC5	125	125	0	125	0		0	0
NC5	124	124	0	124	0		0	0
NC6	9	9	0	9	0	0	0	0
Recoveries:								
Propane		99.5%						
Butanes+		100.0%						
Residue Gas Compressor		43,000 HP		43.00 HP/MMscfd				

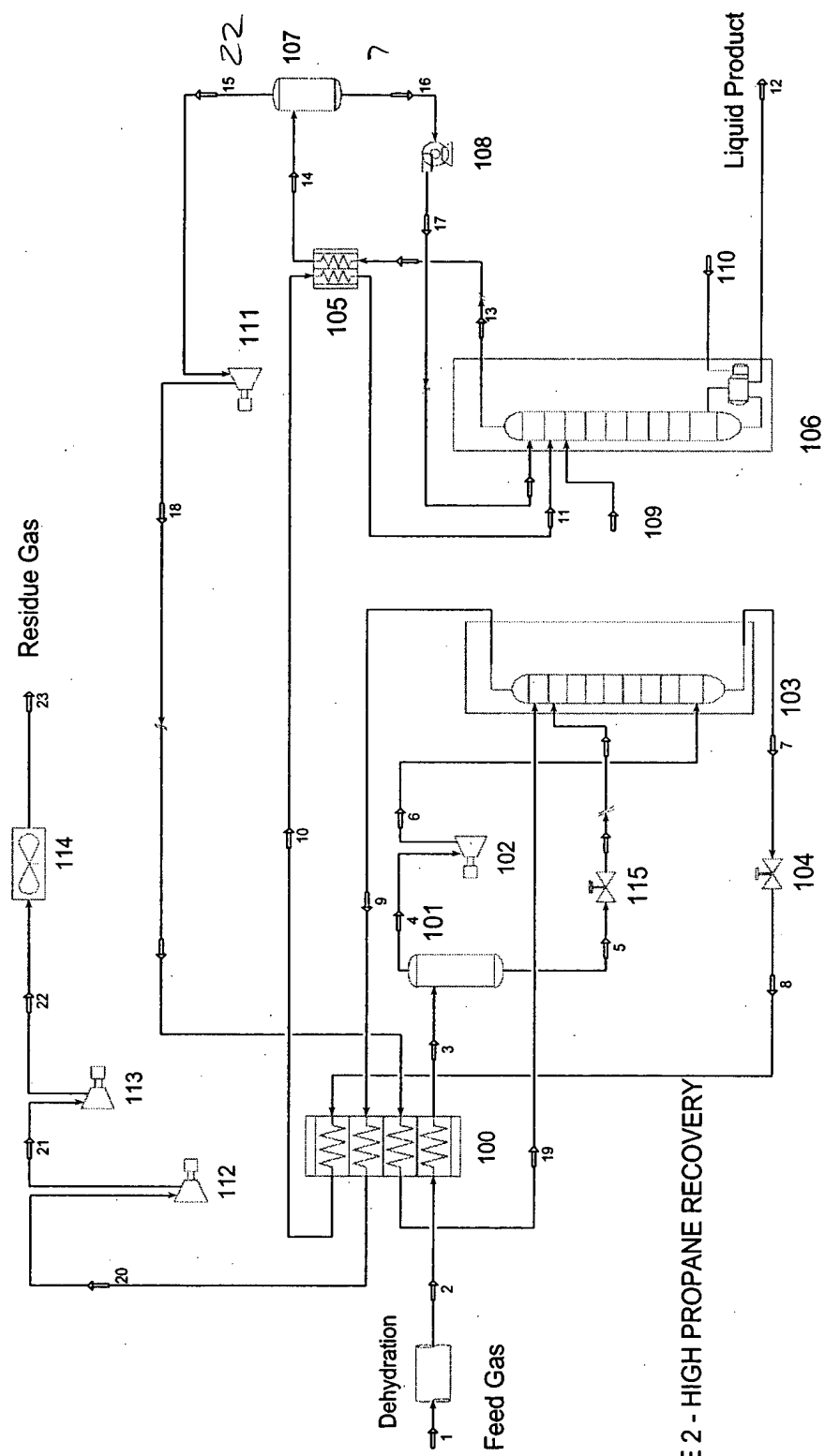
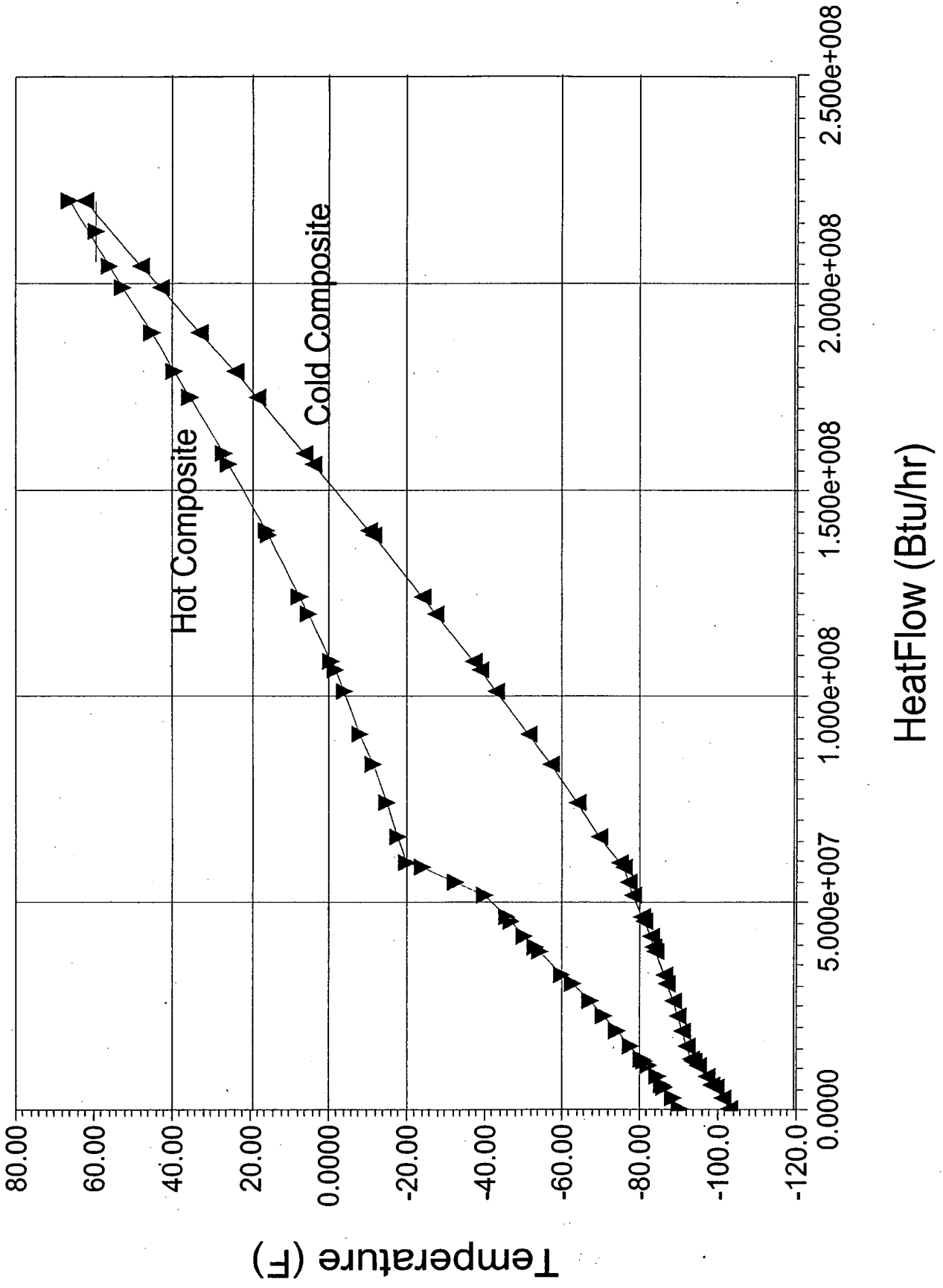
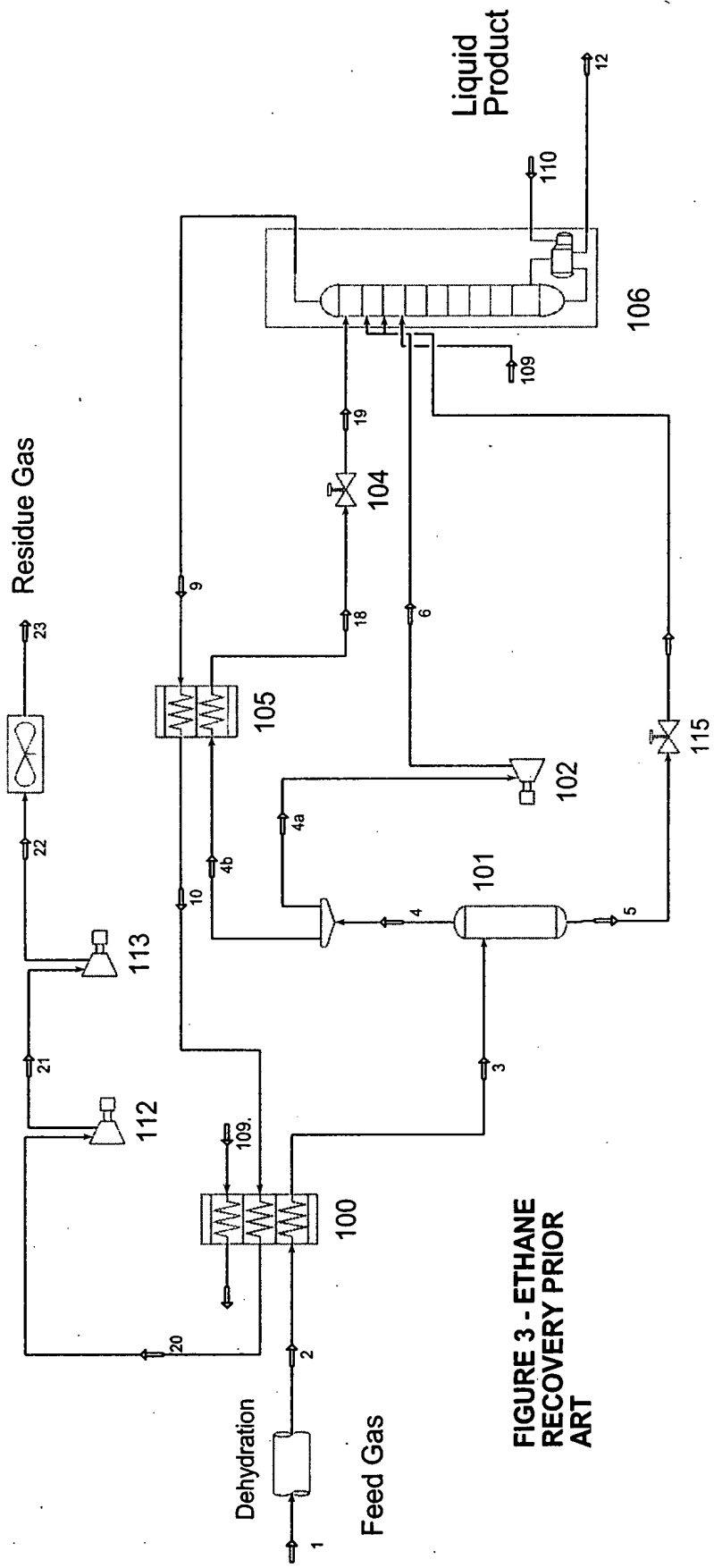


Figure 2A - High Propane Recovery Composite Curve





**FIGURE 3 - ETHANE
RECOVERY PRIOR
ART**

TABLE 3 - STREAM SUMMARY FOR FIGURE 3 ETHANE RECOVERY- PRIOR ART

Stream Number	1	2	3	4	4a	4b	5	6
Temp., °F	68	67	35	35	35	35	35	-62
Pressure, psig	1300	1275	1268	1268	1268	1268	1268	429
Flow, lbmol/hr	109,805	109,805	109,805	109,805	64,236	45,569	-	64,236
Stream Number	9	10	12	16	18	19	20	21
Temp., °F	-125	18	97	55	-121	-132	31	76
Pressure, psig	425	420	428	427	1263	429	415	558
Flow, lbmol/hr	100,496	100,496	9,309	22,201	45,569	45,569	100,496	100,496
Stream Number	22	23	109					
Temp., °F	220	110	32					
Pressure, psig	1315	1300	427					
Flow, lbmol/hr	100,496	100,496	22,201					

Key Stream Component Flow (lbmol/hr)

Stream Number	1	9	12	23
CO2	1,647	1,542	105	1,542
N2	471	471	0	471
C1	97,044	97,043	1	97,043
C2	6,582	1,347	5,236	1,347
C3	2,988	87	2,901	87
IC4	327	3	324	3
NC4	488	3	485	3
IC5	125	0	124	0
NC5	124	0	124	0
NC6	9	0	9	0
Recoveries:				
Ethane		79.5%		
Propane		97.1%		
Butanes+		99.4%		
Residue Gas Compressor		46,230 HP		46.23 HP/MMscfd
CO2 In C2		2.0%		

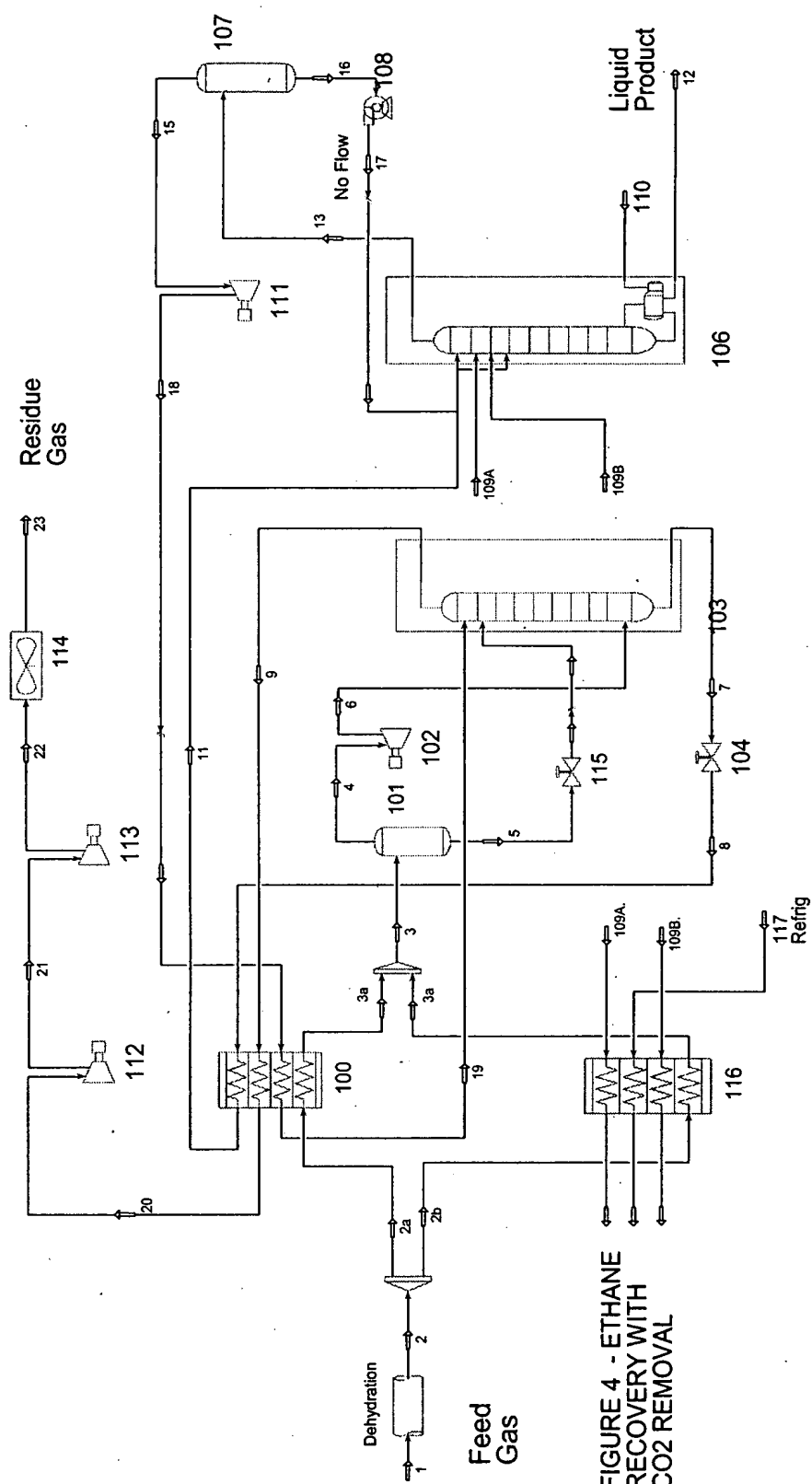


TABLE 4 - STREAM SUMMARY FOR FIGURE 4 ETHANE RECOVERY

Stream Number	1	2	3	4	5	6	7	8
Temp., °F	68	67	-50	-50	-50	-101	-104	-116
Pressure, psig	1300	1275	1268	1268	1268	589	587	475
Flow, lbmol/hr	109,805	109,805	109,805	109,805	-	109,805	66,995	66,995
Stream Number	9	11	12	13	15	16	17	18
Temp., °F	-111	-108	110	-90	-90	-90	-81	-56
Pressure, psig	585	472	450	448	448	448	485	595
Flow, lbmol/hr	101,195	66,995	8,580	58,416	58,416	-	-	58,416
Stream Number	19	20	21	22	23	109A.	109B.	117
Temp., °F	-111	62	87	198	110	-27	-89	6
Pressure, psig	588	575	675	1315	1300	449	458	28
Flow, lbmol/hr	58,386	101,195	101,195	101,195	101,195	21,550	33,597	4,105

Key Stream Component Flow (lbmol/hr)

Stream Number	1	7	9	11	12	13	17	23
CO2	1,647	1,723	1,644	1,723	2	1,720	-	1,644
N2	471	117	471	117	0	117	-	471
C1	97,044	53,038	97,016	53,038	0	53,038	-	97,016
C2	6,582	7,870	2,013	7,870	4,568	3,302	-	2,013
C3	2,988	3,162	50	3,162	2,938	224	-	50
IC4	327	334	1	334	326	7	-	1
NC4	488	494	1	494	487	7	-	1
IC5	125	125	0	125	125	1	-	0
NC5	124	124	0	124	124	0	-	0
NC6	9	9	0	9	9	0	-	0
Recoveries:								
Ethane		69.4%						
Propane		98.3%						
Butanes+		99.9%						
Residue Gas Compressor		35,592	HP					
DeC2 Ovhd Compressor		4,489						
Refrigeration		4,728						
Total HP		44,809						
CO2 in Ethane		500	ppm					
				44.81	HP/MMscfd			

Figure 4A - Ethane Recovery Composite Curve for Feed Exchanger 100

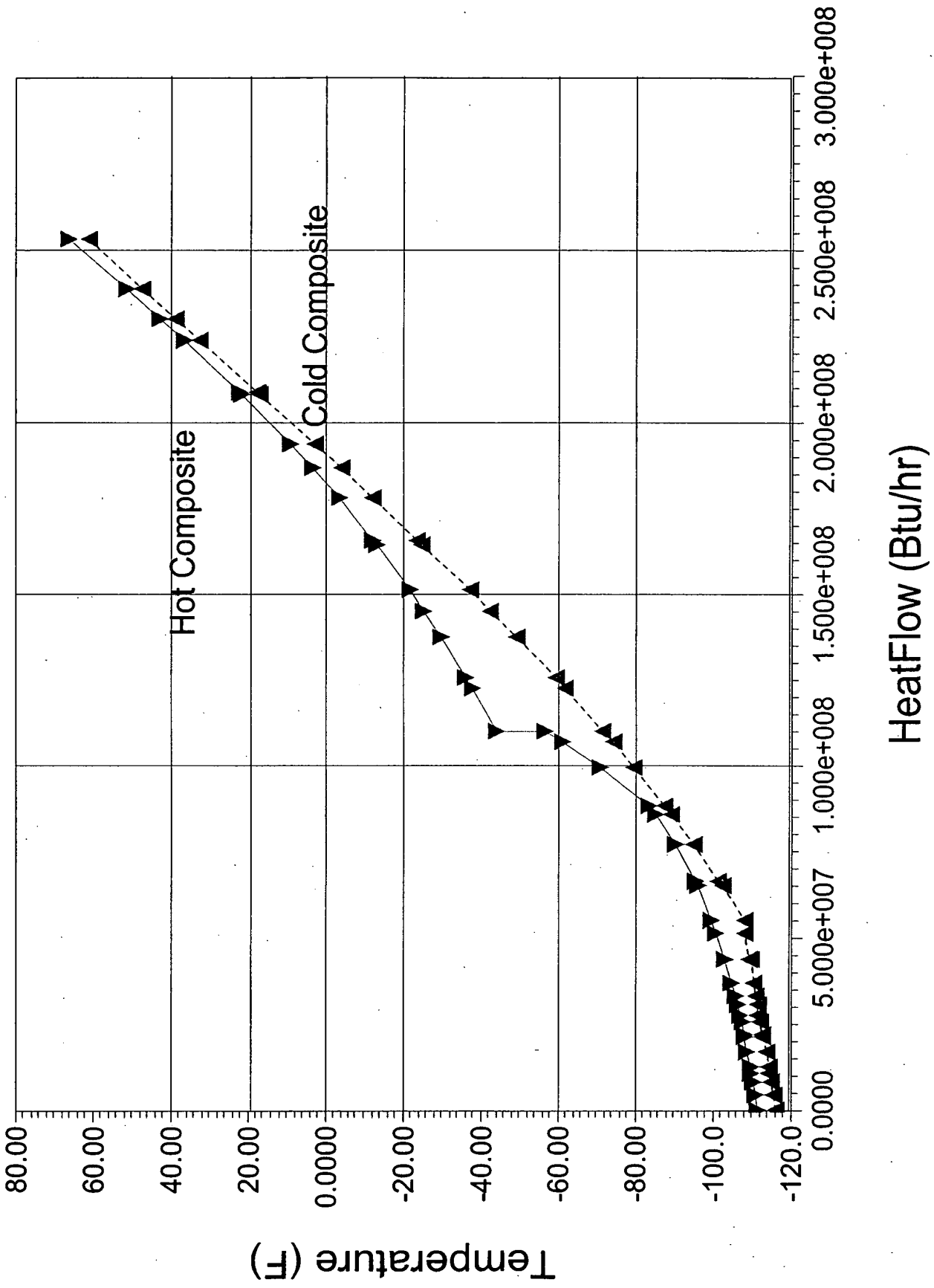
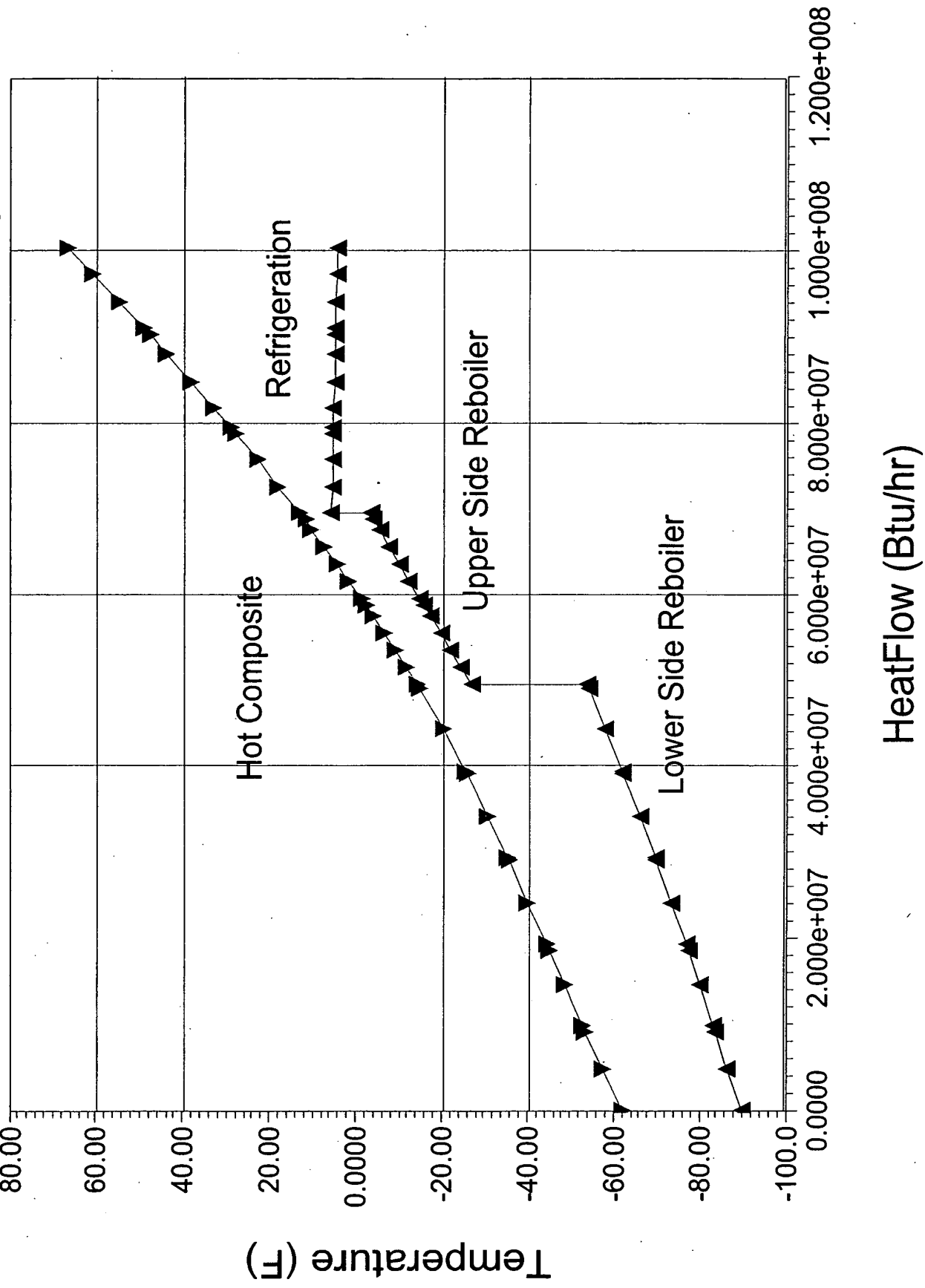


Figure 4B - Ethane Recovery Composite Curve for Side Exchanger 116



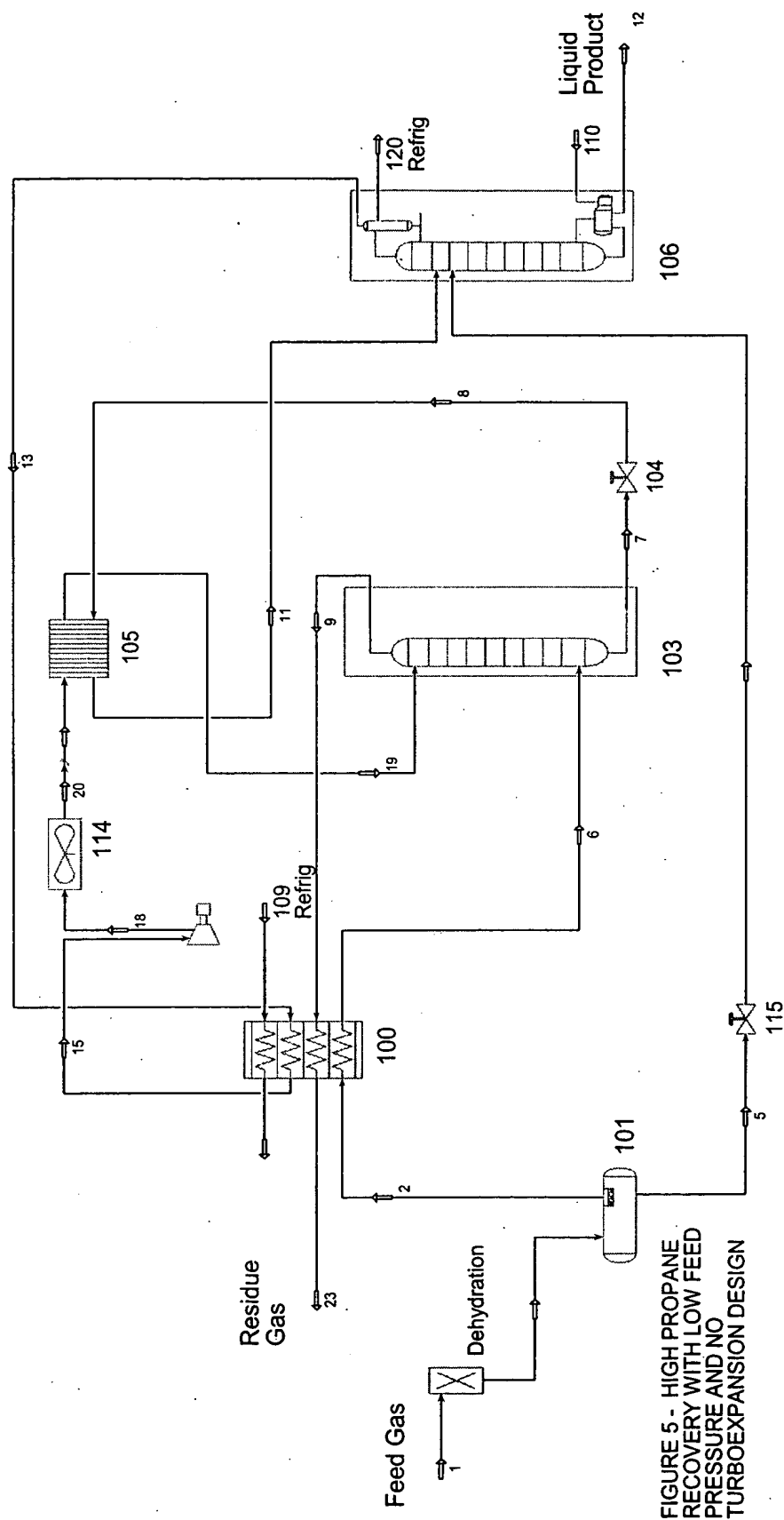


FIGURE 5 - HIGH PROPANE RECOVERY WITH LOW FEED PRESSURE AND NO TURBOEXPANSION DESIGN

Table 5 - STREAM SUMMARY FOR FIGURE 5
HIGH PROPANE RECOVERY WITH LOW FEED PRESSURE AND NO TURBOEXPANSION

Stream Number	1	2	5	6	7	8	9	11
Temp., °F	125	125	125	-45	-47	-61	-58	10
Pressure, psig	765	750	750	743	725	515	720	510
Flow, lbmol/hr	109,805	107,684	1,517	107,684	53,394	53,394	91,164	53,394

Stream Number	12	13	15	18	19	20	23
Temp., °F	239	-30	95	168	-50	100	100
Pressure, psig	506	500	493	780	770	775	713
Flow, lbmol/hr	17,686	37,224	37,224	37,224	36,874	37,224	91,164

Key Stream Component Flow (lbmol/hr)

Stream Number	1	2	5	7	9	12	13	23
CO2	1,647	1,648	1,649	1,650	1,651	1,652	1,653	1,654
N2	3,814	3,808	6	520	3,809	0	526	3,809
C1	70,549	70,297	252	23,535	70,338	0	23,787	70,338
C2	10,767	10,645	121	8,598	10,529	144	8,575	10,529
C3	10,284	10,017	267	10,233	282	10,000	500	282
IC4	2,002	1,908	94	1,908	0	2,002	0	0
NC4	2,813	2,648	164	2,648	0	2,813	0	0
IC5	829	744	85	744	0	829	0	0
NC5	656	576	79	576	0	656	0	0
NC6+	1,242	834	408	834	0	1,242	0	0

Recoveries:
Propane 97.2%
Butanes+ 100.0%

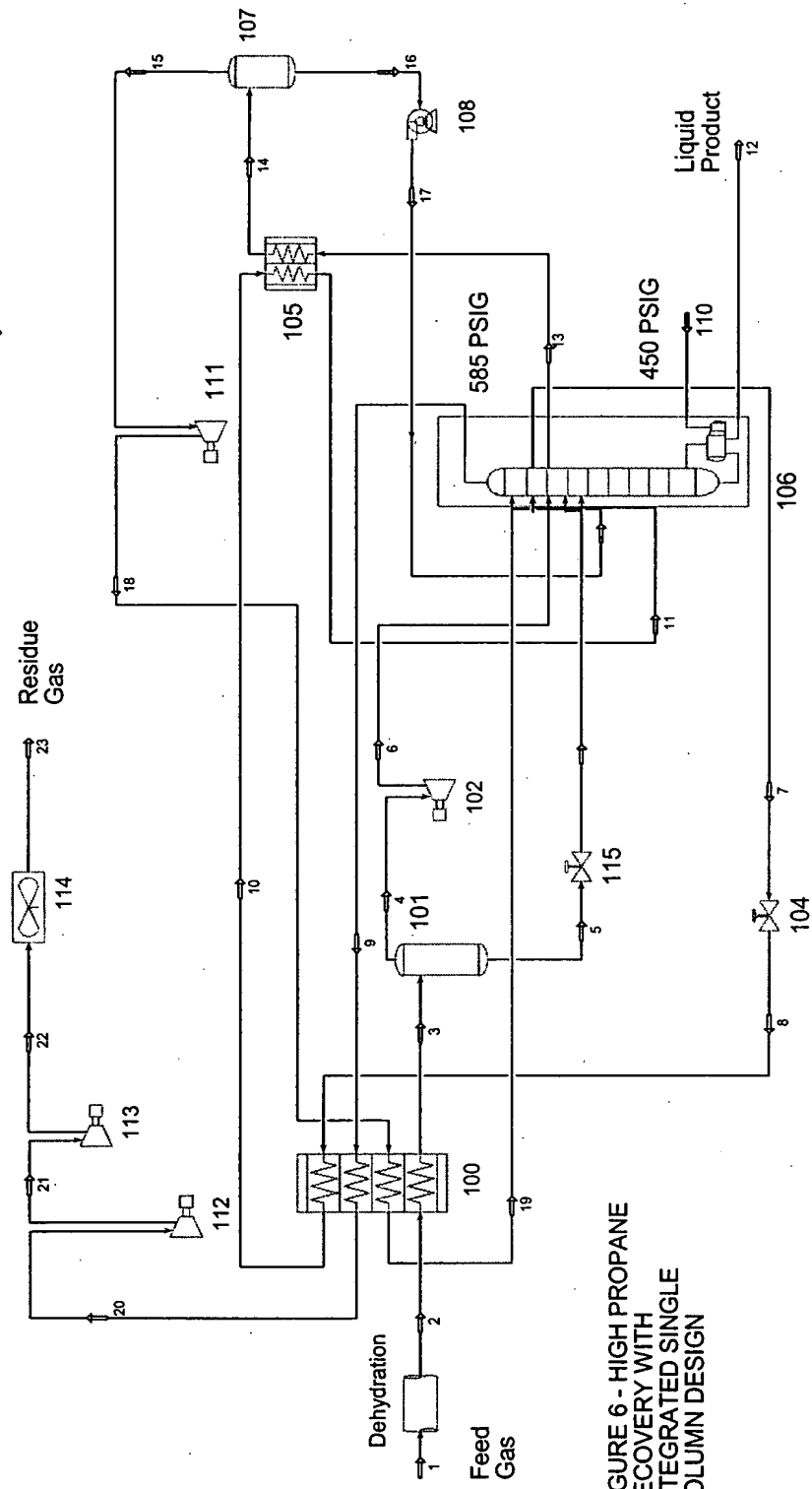


FIGURE 6 - HIGH PROPANE
RECOVERY WITH
INTEGRATED SINGLE
COLUMN DESIGN